Claims

What is claimed is:

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1. A method for encoding a video signal to produce a bit-stream comprising the steps of:

encoding a first complete frame by forming a first portion of the bit-stream comprising information for reconstruction of the first complete frame the

10   information being prioritised into high and low priority information;

defining a first virtual frame on the basis of a version of the first complete frame constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and

15   encoding a second complete frame by forming a second portion of the bit-stream comprising information for use in reconstruction of the second complete frame such that the second complete frame can be reconstructed on the basis of the first virtual frame and the information comprised by the second portion of the bit-stream rather than on the basis of the first complete frame and the information comprised

20   by the second portion of the bit-stream.

2. A method according to claim 1 comprising the steps of:

prioritising the information of the second complete frame into high and low priority information;

25   defining a second virtual frame on the basis of a version of the second complete frame constructed using the high priority information of the second complete frame in the absence of at least some of the low priority information of the second complete frame; and

encoding a third complete frame by forming a third portion of the bit-stream

30   comprising information for use in reconstruction of the third complete frame such that the third complete frame can be reconstructed on the basis of the second

complete frame and the information comprised by the third portion of the bit-stream.

3. A method according to claim 1 comprising the step of choosing a temporal prediction path by predicting a subsequent complete frame on the basis of a directly preceding virtual frame rather than on the basis of a directly preceding complete frame.

4. A method according to claim 1 comprising the step of selecting a particular reference frame amongst a plurality of choices to predict another frame.

5. A method according to claim 1 comprising the step of associating each complete frame with a plurality of different virtual frames, each representing a different way to classify the bit-stream for the complete frame.

6. A method according to claim 1 comprising the step of encoding a virtual frame using both its high and low priority information and predicting it on the basis of another virtual frame.

7. A method according to claim 1 comprising the step of encoding virtual frames by using multiple algorithms.

8. A method according to claim 7 comprising the step of signalling in the bit-stream the selection of a particular algorithm.

9. A method according to claim 1 comprising the step of replacing low priority information by default values in order to be able to carry out decoding of a virtual frame.

10. A method for decoding a bit-stream to produce a video signal comprising the steps of:

decoding a first complete frame from a first portion of the bit-stream comprising information for reconstruction of the first complete frame the information being prioritised into high and low priority information;

defining a first virtual frame on the basis of a version of the first complete frame
5   constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and

predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-stream rather than on the
10   basis of the first complete frame and information comprised by the second portion of the bit-stream.

11. A method according to claim 10 comprising the steps of

defining a second virtual frame on the basis of a version of the second complete
15   frame constructed using the high priority information of the second complete frame in the absence of at least some of the low priority information of the second complete frame; and

predicting a third complete frame on the basis of the second complete frame and information comprised by a third portion of the bit-stream.
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12. A method according to claim 10 comprising the step of prioritising the information for the reconstruction of the first complete frame into high and low priority information according to its significance in producing a reconstructed version of the first complete frame.
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13. A video encoder for encoding a video signal to produce a bit-stream comprising:

a complete frame encoder for forming a first portion of the bit-stream of a first complete frame containing information for reconstruction of the first complete
30   frame the information being prioritised into high and low priority information;

a virtual frame encoder defining at least a first virtual frame on the basis of a version of the first complete frame constructed using the high priority information

of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and

a frame predictor for predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-stream
5 rather than on the basis of the first complete frame and the information comprised by the second portion of the bit-stream.

14. An encoder according to claim 13 which sends a signal to a corresponding decoder to indicate which part of the bit-stream for a frame is sufficient to produce
10 an acceptable picture to replace a full-quality picture in case of a transmission error or loss of information.

15. An encoder according to claim 14 in which the signal indicates which one of multiple pictures is sufficient to produce an acceptable picture to replace a full-
15 quality picture.

16. An encoder according to claim 13 which is provided with a multi-frame buffer for storing complete frames and a multi-frame buffer for storing virtual frames.

20 17. A decoder for decoding a bit-stream to produce a video signal comprising:
a complete frame decoder for decoding a first complete frame from a first portion of the bit-stream containing information for reconstruction of the first complete frame the information being prioritised into high and low priority information;
a virtual frame decoder for forming a first virtual frame from the first portion of the
25 bit-stream of the first complete frame using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and
a frame predictor for predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-stream
30 rather than on the basis of the first complete frame and the information comprised by the second portion of the bit-stream.

18. A decoder according to claim 17 which is provided with a multi-frame buffer for storing complete frames and a multi-frame buffer for storing virtual frames.

19. A decoder according to claim 17 in which feedback is provided from the decoder to a corresponding encoder in the form of an indication that concerns indicated codewords of one or more specified pictures.

20. A video communications terminal comprising a video encoder for encoding a video signal to produce a bit-stream, the video encoder comprising:

a complete frame encoder for forming a first portion of the bit-stream of a first complete frame containing information for reconstruction of the first complete frame the information being prioritised into high and low priority information;

a virtual frame encoder defining at least a first virtual frame on the basis of a version of the first complete frame constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and

a frame predictor for predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-stream rather than on the basis of the first complete frame and the information comprised by the second portion of the bit-stream.

21. A video communications terminal comprising a decoder for decoding a bit-stream to produce a video signal, the decoder comprising:

a complete frame decoder for decoding a first complete frame from a first portion of the bit-stream containing information for reconstruction of the first complete frame the information being prioritised into high and low priority information;

a virtual frame decoder for forming a first virtual frame from the first portion of the bit-stream of the first complete frame using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and

a frame predictor for predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-stream

rather than on the basis of the first complete frame and the information comprised by the second portion of the bit-stream.

22. A computer program for operating a computer as a video encoder for encoding
5   a video signal to produce a bit-stream comprising:
computer executable code for encoding a first complete frame by forming a first portion of the bit-stream containing information for reconstruction of the first complete frame the information being prioritised into high and low priority information;
10 computer executable code for defining a first virtual frame on the basis of a version of the first complete frame constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame; and
computer executable code for encoding a second complete frame by forming a
15 second portion of the bit-stream comprising information for reconstruction of the second complete frame such that the second complete frame the second complete frame to be reconstructed on the basis of the virtual frame and the information comprised by the second portion of the bit-stream rather than on the basis of the first complete frame and the information comprised by the second portion of the
20 bit-stream.

23. A computer program for operating a computer as a video decoder for decoding a bit-stream to produce a video signal comprising:
computer executable code for decoding a first complete frame from a portion of
25 the bit-stream containing information for reconstruction of the first complete frame the information being prioritised into high and low priority information;
computer executable code for defining a first virtual frame on the basis of a version of the first complete frame constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information
30 of the first complete frame; and
computer executable code for predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-

stream rather than on the basis of the first complete frame and information comprised by the second portion of the bit-stream.

24. A method for encoding a video signal to produce a bit-stream comprising the
5 steps of:

encoding a first complete frame by forming a first portion of the bit-stream comprising information for reconstruction of the first complete frame the information being prioritised into high and low priority information;

defining a first virtual frame on the basis of a version of the first complete frame
10 constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame;

encoding a second complete frame by forming a second portion of the bit-stream comprising information for use in reconstruction of the second complete frame the information being prioritised into high and low priority information the second frame
15 being encoded such that it can be reconstructed on the basis of the first virtual frame and the information comprised by the second portion of the bit-stream rather on the basis of the of the first complete frame and the information comprised by the second portion of the bit-stream;

defining a second virtual frame on the basis of a version of the second complete
20 frame constructed using the high priority information of the second complete frame in the absence of at least some of the low priority information of the second complete frame; and

encoding a third complete frame which is predicted from the second complete frame and follows it in sequence by forming a third portion of the bit-stream
25 comprising information for use in reconstruction of the third complete frame such that the third complete frame can be reconstructed on the basis of the second complete frame and the information comprised by the third portion of the bit-stream.

30 25. A method according to claim 24 in which the second frame is reconstructed by selecting one of at least a first prediction route and a second prediction route, wherein in the first prediction route the second complete frame is reconstructed on

the basis of the first virtual frame and the information comprised by the second portion of the bit-stream and in the second prediction route the second complete frame is reconstructed on the basis of the of the first complete frame and the information comprised by the second portion of the bit-stream.

26. A method for decoding a bit-stream to produce a video signal comprising the steps of:

decoding a first complete frame from a first portion of the bit-stream comprising information for reconstruction of the first complete frame the information being prioritised into high and low priority information;

defining a first virtual frame on the basis of a version of the first complete frame constructed using the high priority information of the first complete frame in the absence of at least some of the low priority information of the first complete frame;

predicting a second complete frame on the basis of the first virtual frame and information comprised by a second portion of the bit-stream rather than on the basis of the first complete frame and information comprised by the second portion of the bit-stream;

defining a second virtual frame on the basis of a version of the second complete frame constructed using the high priority information of the second complete frame in the absence of at least some of the low priority information of the second complete frame; and

predicting a third complete frame on the basis of the second complete frame and information comprised by a third portion of the bit-stream.

27. A method according to claim 26 in which the second frame is reconstructed by selecting one of at least a first prediction route and a second prediction route, wherein in the first prediction route the second complete frame is reconstructed on the basis of the first virtual frame and the information comprised by the second portion of the bit-stream and in the second prediction route the second complete frame is reconstructed on the basis of the of the first complete frame and the information comprised by the second portion of the bit-stream.